

Boss Laser Quick Setup Procedures

Before you Start:

Be sure to read and understand **Sections A and B** of this handout before you begin to set up and operate the laser cutting machine as described in **Sections C and D**. All students **MUST** read and understand sections A and B before they are allowed to operate the machine. **Technical help is available at: Phone Number: 1.888.652.1555**
Email: TechSupport@bosslaser.com

Section A

CO2 Laser Safety/Policies

Be careful. Laser machines are powerful tools, designed to cut or engrave with highly focused heat energy. The following safety measures must be strictly enforced and abided by.

1. Never operate laser machinery unless you have been properly trained.
2. Always use protective eyewear, preferably wraparound goggles.
3. Always turn the Exhaust Fan on while running the laser.
4. Never set anything on top of the laser.
5. Never dismantle the laser machine.
6. Never let anyone unfamiliar with the machine operate it.
7. Always keep access covers on the sides and top lid closed.
8. Avoid any direct exposure and never stare at the laser light while operating.
9. Notice and understand all of the warning labels attached to your machine.
10. Never leave the laser unattended. Remain with the machine when it is running at all times so that you can hear and observe abnormalities and potential hazards.
11. Always maintain the machine's environment free of heavy pollution such as strong magnetic interference and strong electricity.
12. Never use unapproved or unsafe materials, such as Polyvinyl Chloride (PVC) or materials that emit noxious gases that can cause harm to your central nervous system. (See pages 6 & 7 of operator's manual– Safe materials for you and your laser)
13. Never operate the laser near flammable and explosive substances. The UV light beam that is emitted is not visible and poses a great fire hazard.

14. Never open the upper cover of the laser machine while it is running & NEVER engrave a shiny metal or mirror. The laser beam can reflect and deviate (bounce around) which can cause Blindness or Serious Injury requiring medical attention.
15. Never push or pull the laser head and its gantry while the laser is running.
16. Never dismantle the laser machine. There are laser and high pressure parts that can cause grave harm or injury.

In Case of Fire:

1. Press the **EMERGENCY STOP** button located above the LCD Panel
2. Lift the lid
3. Quickly blow out the flame (or use fire extinguisher for serious flames)

Section B

General Instructions About the Machine and Software

If you want to design on the attached computer and then download to the laser cutting machine, it is recommended that you first watch the video: **LaserCut 5.3 Software Tutorial Parts 1-11** located at <http://www.transonturkiye.com/tutorials.html>. This video will walk you through the system's window menu options and tools, basic methods of sketching, manipulating objects, and downloading with LaserCut software.

1. Boss laser machine is in metric and so dimensions must be converted to metric before importing to the machine.
2. The machine's platform size or engraving area is 36x48 inches. See page 11 for other specs.
3. A tray at the bottom of the machine collects the debris during cutting. Clean this tray after use.
4. Never cut aluminum, copper, titanium plate and galvanized steel sheet.
5. The air filter, coolant, and air pressure must be on during laser cutting.
6. Do not clamp the workpiece on this machine during laser cutting and engraving.
7. For cutting, the recommended maximum workpiece thickness is ¼" for wood and acrylics (plastics) and 20 gauge for sheet steel.
8. For each material, thickness and laser power, there are optimum cutting speeds and cutting powers.
9. For each material thickness, the gap between the material and the laser head power **MUST** be adjusted to the specified gap size before starting the operation.
10. Always engrave your workpiece first before cutting the piece.

11. For engraving on top of the workpiece, there is no thickness limit.
12. Clear program files that are saved in the motion controller memory after use to avoid clogging the memory. System has only 128 megabytes of memory. Deleting the memory contents eliminates confusion of what project file to run.
13. The LaserCut 5.3 software has the drawing tools on the left side of the screen, the top has the function tools, and the right has machine control and download tools.
14. Use the .ECP file extension to save all files here.
15. Different colors (layers) can be used to designate different operations on same project.
16. The top right menu bar allows for settings for different materials, thicknesses, cutting power, engraving power, layers, laser head speeds, and scan gaps. **(Note that these setting must be tried and fine-tuned until ideal settings are determined for each job)**
17. All cutting must be done in one pass, but engraving may be done in multiple passes.
18. Designs can be created in just about any software and then imported. It is recommended that all files be save in DXF format.
19. You must have a dongle to use the software.
20. For engraving, leave speed at 300 millimeters per second. For cutting leave it at 15-20 millimeters per second.
21. Keep power at about 90 percent for cutting and about 30 percent for engraving. Scan gap should be at .07 during engraving.
22. When downloading files through a PC, go to **Tools** and select **Unite Lines**. Keep tolerance at .05 millimeter and then click **OK**. This will unite all the lines and line up the arrows.
23. It is recommended that you use DXF format for both exporting and importing related design files to and from other computers.
24. To send a file from USB to the computer attached to the laser machine, click on **Download**, then go to **Export File** and then select the file to download. System will create a text file and a .mol file.
25. To use the laser machine, save your project files in the root directory of your flash drive as .MOL or .ECP file. These are the only languages that the laser machine's controller can understand. The motion controller is most compatible to USB flash drives that are formatted to FAT file system.

Section C

Step-By-Step Procedures on Downloading Project Files from the Attached Computer to Laser Machine

1. Turn the laser machine's power switch on. Both the key and emergency buttons must be turned on as shown in the picture.

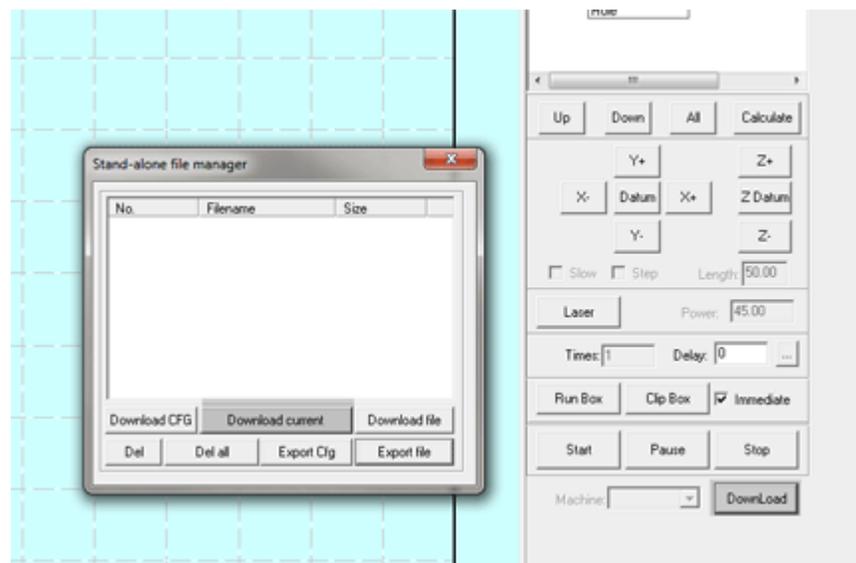


2. Open the machine cover as shown in this picture and place your workpiece at the center and on top of the machine's table. Do not clamp the workpiece.



3. Plug the USB cable from the laser machine to the attached computer.
4. Ensure the dongle is plugged to the computer. System will not work without a dongle.

5. Open LaserCut 5.3 software on the attached computer workstation.
6. Create a new design or open your already saved file from your USB flash drive. (If you are not yet familiar with how to use LaserCut 5.3, it is recommended that you first watch the video: **LaserCut 5.3 Software Tutorial Parts 1-11** located at <http://www.transonturkiye.com/tutorials.html> before continuing).
7. Remember to use DXF to download, export or import files on this machine. Also, only .MOL or .ECP files can be used for the laser machine.
8. Double-click on **Layer** to change speeds, power and interval or DPI rating and then click **OK**. (**Note that these setting must be tried and fine-tuned until ideal settings are determined for each job**)
9. Click on **Layer** pull-down menu to select **Engrave** or **Cut**.



10. Click on **Download** button in the lower right corner as illustrated in the picture. Click on the **Download Current** button shown in the file manager pop up to send your file to the machine. Be sure to name the file a name you can recognize.
11. Close the download pop-up window.
12. Use the **XY** arrows to move and position the laser head nozzle to where you want the cut to begin on the part.
13. Move over to the laser machine and control the rest of the procedures from the machine's control keypads.
14. Put on your safety goggles.

15. Flip the switch on the side to **Metal** or **Nonmetal** to indicate your material type.
16. Press the upper machine control touch screen **File** button to pull up the file manager.
17. Use the **XY** arrows to scroll to your file name and press **Enter**. The file will be selected and loaded on the window.
18. Use the acrylic rectangular gauge to set the laser head to 1 millimeter above the top of the workpiece as shown in this picture, i.e. until the lip of the rectangle makes contact with the flat step on the laser head while sitting flush on the workpiece top surface as shown. The head's Z axis is moved by lag-pressing



the **up** or **down** arrow button of the lower control touch screen panel shown in this picture. (Note that the arrows can only function when the file name has been selected, loaded and highlighted.) Be careful not to crash the laser nozzle on the workpiece. There is a lag, so you will have to hold the button down for a few seconds before it responds. Likewise, you will need to release it a few seconds before you want the head to stop moving.



19. At this time the system is perfectly focused for the laser.
20. Press **Test** button shown in the picture below to outline/trace where the engraving or cut will take place (the laser head will move in the boundary area of the design). This will help you understand where the job is going to be placed.
21. You may reposition your workpiece at this time.
22. Repeat the **Testing** process again just to be sure.



23. Turn on the **water chiller**, **air pump** and the **exhaust system** located behind the machine.
24. Press the **Laser** button shown in the picture. This will fire off the laser.
25. Close the lid.
26. Press the **Start** button shown in the picture and the machine will begin the job.
27. When the job is completed, open the lid, use the **XY** arrows to move the laser head away from the part, and then remove the part. Note that pressing **XY-0** button will move the head to machine home location.
28. Turn off power, shut off the air pressure, water chiller systems, and exhaust system.
29. Empty the tray and clean up the machine.
30. Close the lid
31. Close the LaserCut 5.3 window, log off from the computer and remove your flash drive if you used one.

Section D

Step-By-Step Procedures on Downloading Project Files to Laser Machine Using USB Flash Drive

1. (This section assumes you have a small capacity memory, FAT 16 formatted flash drive. Your file must be saved in the root directory and in .mol or .ECP format. System will not work without these).
2. Put on your safety goggles.
3. Turn the laser machine's power switch on.
4. Open the machine lid as shown in this picture and place your workpiece on top of the machine's table. Do not clamp the workpiece.
5. Make sure to delete all existing files that are saved in the motion controller memory, using the **XY** arrow keys to select files and hitting **Enter**. Deleting the memory contents eliminates confusion of what project file to run. The blank line proves the memory is empty.
6. Insert the USB flash drive into the access port on the right side of the laser machine toward the front.
7. The Motion controller will recognize the USB flash drive and show the available .mol or .ECP type files. Use the **XY** arrows to select the appropriate file and press the **Enter** button.
8. After the file is downloaded, remove the USB flash drive.
9. The motion controller will reset and show the project filename that was just loaded.
10. Use the **XY** arrows to scroll to your file name and press **Enter**. The file will be selected and loaded on the window.
11. Flip the switch on the side to **Metal** or **Nonmetal** to indicate your material type.
12. Use the **XY** arrows to move the laser head nozzle to where you want the work to begin on your workpiece.
13. Use the acrylic rectangular gauge to set the laser head to 1 millimeter above the top of the workpiece as shown in this picture, i.e. until the lip of the rectangle makes contact with the flat step on the laser head while sitting flush on the workpiece top surface as shown. The head's Z axis is moved by lag-pressing





the **up** or **down** arrow button of the lower control touch screen panel shown in the picture below. (Note that the arrows can only function when the file name has been selected, loaded and highlighted.) Be careful not to crash the laser nozzle on the workpiece. There is a lag, so you will have to hold the button down for a few seconds before it responds. Likewise, you will need to release it a few seconds before you want the head to stop moving.

14. At this time the system is perfectly focused for the laser.



15. Press **Test** button shown in the picture to outline/trace where the engraving or cut will take place (the laser head will move according to the outline of the design). This will help you understand where the job is going to be placed.
16. You may reposition your workpiece at this time.
17. Repeat the **Testing** process again just to be sure.



18. Turn on the **water chiller**, **air pump** and the **exhaust system**.
19. Press the **Laser** button shown in the picture. This will fire off the laser.
20. Close the lid.
21. Press the **Start** button shown in the picture and the machine will begin the job.
22. When the job is completed, open the lid, use the **XY** arrows to move the laser head away from the part, and then remove the part. Note that pressing XY/0 button will move the head to machine home location.
23. Turn off power, shut off the air pressure, water chiller systems, and exhaust system.
24. Empty the tray and clean up the machine.
25. Close the lid

Appendices

(Boss Laser Machine SS 3650 and LaserCut 5.3 Specs, Training Videos and Other Resource Materials)

Specifications:

1. Platform Size / Engraving Area = 36x48 inches.
2. Work Area = 36 x 50 " + 5 pass thrus.
3. Z-Axis is Motorized (12 in. Adjustable).
4. Available Power is 150.
5. Weight is 850 lbs.
6. Dimensions are W x L x H inches = 70 x 57 x 42.
7. Software is LaserCut 5.3(w/ drivers for most design software).
8. Honeycomb Table is removable aluminum platform for small material.
9. Power Supply is premium A C 110V (220V upon request).
10. Warranty 12 months (includes parts & CO2 tube).

Training Videos:

1. **EngraveLab v9 Training:** <https://www.youtube.com/watch?v=4b001iRhL2E>
2. **LaserCut 5.3 Software Tutorial:**
<https://www.youtube.com/watch?v=E1WzlfEmlu0>
3. **LaserCut 5.3 Software Operation: (Setting+Sample):**
<https://www.youtube.com/watch?v=wa2sONLyONY>
4. **LaserCut 5.3 Tutorial Videos and FAQ:**
<http://www.transonturkiye.com/tutorials.html>

Other Resource Materials:

1. **Boss Laser SS 3650 Specs:**
https://www.engraverschoice.com/uploads/2EC1_Boss_SS_3650_Laser_Brochure.pdf
2. **Startup procedure:**
<http://www.rabbitlaserusa.com/Manuals/StartupProcedure.pdf>
3. **Installing the LaserCut 5.3 Software:**
http://www.rabbitlaserusa.com/Manuals/Installing%20the%20LaserCut%205_3.pdf
4. **Working with LaserCut 5.3 to cut a simple circle:**
http://www.rabbitlaserusa.com/Manuals/LaserCut53_FirstCutCircle.pdf
5. **Working with Laser it to make a key identification tag:**
http://www.rabbitlaserusa.com/Manuals/LaserCut53_KeyTag.pdf
6. **LaserCut – The Alternate Manual:**
<https://www.i3detroit.org/wi/images/b/b4/LaserCut5AlternateManual.pdf>
7. **FAQ:** [View on www.rabbitlaserusa.com](http://www.rabbitlaserusa.com)